

CLAIM AMENDMENTS

1. (Currently Amended) A power circuit for a battery comprising:
a first energy storage source;
a second energy storage source connected in series with the first energy storage source;
a DC/DC converter for converting an electric power between the first energy storage source and the second energy storage source; and
control means for controlling the DC/DC converter, wherein
the control means detects a voltage of the one of the first and second energy storage sources that is disposed on a high voltage side, ~~from among the first and second as the high voltage side energy storage sources which are connected in series with each other~~ source, and
~~wherein, when the detected voltage detected is lower than a predetermined first threshold voltage, the control means charges the high voltage side energy storage source disposed on the high voltage side with electricity~~ through the DC/DC converter.
2. (Currently Amended) ~~A~~ The power circuit for a battery according to claim 1, wherein the control means detects the voltage of the ~~energy storage source disposed on the high voltage side~~ energy storage source, and when the ~~detected~~ voltage detected is lower than the first threshold voltage, keeps an engine running and does not perform an engine stopping operation.
3. (Currently Amended) A power circuit for a battery according to claim 1, wherein the control means detects the voltage of the ~~energy storage source disposed on the high voltage side~~ energy storage source, and when the ~~detected~~ voltage detected is lower than the first threshold voltage, charges the ~~energy storage source disposed on the high voltage side with electricity~~ energy storage source through the DC/DC converter while keeping an engine running, and when the ~~detected~~ voltage detected is higher than the first threshold voltage, stops the engine.
4. (Currently Amended) ~~A~~ The power circuit for a battery according to ~~any one of claims claim 1 to 3~~ claim 1 to 3, wherein the control means detects a voltage of the first energy storage source and a voltage of the second energy storage source, and adjusts a value of the first threshold voltage in accordance with a value of the voltage of the one of the first

and second energy storage source sources that is disposed on a low voltage side ~~from among the first and second energy storage sources.~~

5. (Currently Amended) A power circuit for a battery connected to an electric motor through an electric conversion circuit comprising:

a first energy storage source;

a second energy storage source connected in series with the first energy storage source;

a DC/DC converter for converting ~~an~~ electric power between the first energy storage source and the second energy storage source; and

control means for controlling the DC/DC converter, wherein, when the electric motor in a stop state is started, the control means detects a voltage of the one of the first and second energy storage source sources that is disposed on a high voltage side, ~~from among the first and second~~ as the high voltage side energy storage sources which are connected in series with each other source, and adjusts ~~an output~~ electric power ~~of output~~ by the DC/DC converter in accordance with ~~a value of the detected~~ voltage detected.

6. (Currently Amended) ~~A~~ The power circuit for a battery according to claim 5, wherein the control means detects ~~a~~ voltage of the one of the first and second energy storage source sources that is disposed on a low voltage side, ~~from among the first and second~~ as the low voltage side energy storage sources which are connected in series with each other source, and when ~~a value of the detected~~ voltage detected at the low voltage side energy storage source is equal to or smaller no larger than a predetermined second threshold voltage, controls ~~an~~ output of the DC/DC converter so that ~~a current of the low voltage side energy storage source disposed on the low voltage side becomes minimum is~~ minimized.

7. (Currently Amended) ~~A~~ The power circuit for a battery according to ~~any one of claims claim 1 to 4~~, wherein the control means detects ~~a voltage value~~ of the one of the first and second energy storage source sources disposed on a low voltage side ~~from among, as the first and second low voltage side energy storage sources which are connected in series with each other source~~, and when the voltage value detected at the low voltage side energy storage source is smaller than a predetermined third second threshold voltage, increases ~~a value of~~ the first threshold voltage.

8. (Currently Amended) A power circuit for a battery, comprising:
a first energy storage source;
a second energy storage source connected in series with the first energy storage source, the second energy storage source having an allowable input current larger than a permissible input current of the first energy storage source;
an electric power conversion circuit for converting ~~an~~ electric power between an electric motor which is connected to an axle of a vehicle and the first energy storage source and the second energy storage source ~~that are connected in series with each other~~;
a DC/DC converter for converting ~~an~~ electric power between the first energy storage source and the second energy storage source; and
control means for controlling the DC/DC converter, wherein the control means includes DC/DC converter control means for, when ~~a~~ regenerative electric power ~~of generated by~~ the electric motor ~~is charged to~~ charges the first energy storage source and the second energy storage source through the electric power conversion circuit, controlling the DC/DC converter so that an input current to the first energy storage source ~~becomes equal to or smaller than~~ does not exceed the permissible input current of the first energy storage source.

9. (Currently Amended) ~~A~~ The power circuit for a battery according to claim 8 further comprising:
a vehicle speed sensor for detecting ~~a~~ vehicle speed of a vehicle;
a braking command unit for issuing a braking command in accordance with which braking is applied to the vehicle with ~~a desired~~ braking force; and
a first voltmeter for detecting ~~a~~ terminal voltage of the first energy storage source, wherein

the control means comprises:
input current calculation means for calculating ~~a~~ the regenerative ~~energy electric power~~ generated ~~by the electric motor during the electric power regeneration~~ based on the ~~detected~~ vehicle speed detected and the braking force, and for calculating an input current with which the regenerative ~~energy is charged to~~ electric power charges the first energy storage source and the second energy storage source without ~~carrying out an~~ electric power shift in the DC/DC converter; and
allowable input current calculation means for obtaining ~~an a~~ a state-of-charge (SOC) of the first energy storage source, based on ~~a~~ the terminal voltage of the

first energy storage source, to calculate an allowable input current ~~of~~ to the first energy storage source, based on the SOC; and

~~when the regenerative electric power of the electric motor is charged to~~ charges the first energy storage source and the second energy storage source through the electric power conversion circuit, the DC/DC converter control means controls, when the input current obtained from the input current calculation means is larger than the allowable input current obtained from the allowable input current calculation means, the DC/DC converter so that the regenerative electric power is shifted from the first energy storage source to the second energy storage source.

10. (Currently Amended) ~~A~~ The power circuit for a battery according to claim 9, wherein, ~~when the regenerative electric power of the electric motor is charged to~~ charges the first energy storage source and the second energy storage source through the electric power conversion circuit, the DC/DC converter control means controls, when the input current obtained from the input current calculation means is not larger than the allowable input current obtained from the allowable input current calculation means, the DC/DC converter so that the regenerative electric power is shifted from the second energy storage source to the first energy storage source.

11. (Currently Amended) ~~A~~ The power circuit for a battery according to claim 8 further comprising:

a vehicle speed sensor for detecting ~~a~~ vehicle speed of a vehicle;

a braking command unit for issuing a braking command in accordance with which braking is applied to the vehicle with a ~~desired~~ braking force; and

a first voltmeter for detecting ~~a~~ terminal voltage of the first energy storage source, wherein

the control means comprises ~~input current calculation means for calculating a regenerative energy electric power generated by the electric motor during the electric power regeneration based on the detected vehicle speed detected and the braking force, and for calculating an input current with which the regenerative energy is~~ charged to electric power charges the first energy storage source and the second energy storage source without an electric power shift in the DC/DC converter; and

~~wherein, when the regenerative electric power of the electric motor is~~ charged to charges the first energy storage source and the second energy storage source through the electric power conversion circuit, the DC/DC converter control means

controls, when the input current obtained from the input current calculation means is larger than a ~~predetermined~~ value set in advance, the DC/DC converter so that the electric power is shifted from the first energy storage source to the second energy storage source, and controls, when the input current obtained from the input current calculation means ~~is equal to or smaller than~~ does not exceed a ~~predetermined~~ value set in advance, the DC/DC converter so that the electric power is shifted from the second energy storage source to the first energy storage source.

12. (Currently Amended) ~~A~~ The power circuit for a battery according to ~~any one of claims claim 9 to 11~~ further comprising:

a second voltmeter for detecting ~~a~~ terminal voltage of the second energy storage source; and

a brake mechanism connected to an axle of the vehicle for mechanically braking rotation of the axle; ~~and~~, wherein the control means comprises

regeneration-enabling electric power calculation means for, when the electric power is shifted ~~at maximum~~ from the first energy storage source to the second energy storage source through the DC/DC converter, calculating a regeneration-enabling electric power that can be regenerated in the first energy storage source and the second energy storage source based on the terminal voltage of the first energy storage source and the terminal voltage of the second energy storage source; and

mechanical brake control means for, when the ~~regenerative energy~~ electric power obtained from the input current calculation means is larger than the regeneration-enabling electric power, calculating a mechanical brake operation quantity based on ~~a~~ difference between the ~~regenerative energy~~ electric power and the regeneration-enabling electric power, and for controlling the brake mechanism based on the mechanical brake operation quantity.

13. (Currently Amended) ~~A~~ The power circuit for a battery according to claim 12, wherein the second energy storage source ~~has~~ includes a capacitor, and when the regenerative electric power ~~of the electric motor is charged to~~ charges the first energy storage source and the capacitor through the electric power conversion circuit, the DC/DC converter control means controls the DC/DC converter so that an applied voltage becomes ~~equal to or lower~~ no larger than an allowable applied voltage of the capacitor.